

UbD Planning Template

Title: Forces That Shape Our Earth's Surface		Subject/Course: Science
Topic: Physical/Earth Science	Grade: 4th	Designer: Ryan Werner
Stage 1- Desired Results		
Wisconsin State Standards: E.4.1 Investigate that earth materials are composed of rocks and soils and correctly use the vocabulary for rocks, minerals, and soils during these investigations. E.4.2 Show that earth materials have different physical and chemical properties, including the properties of soils found in Wisconsin. E.4.3 Develop descriptions of the land and water masses of the earth and of Wisconsin's rocks and minerals, using the common vocabulary of earth and space science. E.8.2 Describe underlying structures of the earth that cause changes in the earth's surface. E.8.5 Analyze the geologic and life history of the earth, including change over time, using various forms of scientific evidence		
Understandings: Students will understand that... <ol style="list-style-type: none">1. Rocks undergo processes causing them to vary in appearance and structure.2. The Earth is made up of different layers.3. Rocks are formed from different rocks and can be interpreted in a cyclical diagram.4. The earth's surface is constantly changing, some of those changes occur quickly and others slower.5. Processes deep within the Earth's crust cause earthquakes and volcanoes.6. Weathering and erosion shape the earth's landscape in many different ways.	Essential Questions: <ol style="list-style-type: none">1. How do the different rock types compare/contrast with each other?2. How do the different layers of the earth cause volcanoes to erupt?3. How do earthquakes and volcanoes affect buildings, roads, and other objects?4. What happens to a bare hill when it rains very hard?5. How does living close to a volcano/earthquake affect the culture of the people surrounding them?6. Why do people plant trees on a mountainside after a wildfire?	

Students will know...

- The relationship between cause and effect.
- That rocks form from the processes occurring below and on the earth's surface.
- How small events such as erosion change the landscape and how big events like mountain building change at similar rates but at different scale.

Students will be able to ...

- Describe the sequence leading up to a volcano/earthquake and events concerning weathering, deposition and erosion.
- Identify the different layers of the Earth's crust.
- Summarize the ways that rocks change from one type into another type.
- Distinguish the rock types from one another.
- Analyze the differences between rapid and slow surface changes.

Stage 2- Assessment Evidence**Performance Tasks:**

- Guided read aloud (Science Textbook and Seymour Simon/Rebecca Hunter)
- Internet vocabulary game
- Dirt Cake activity
- Earthquaker activity
- Cause and Effect activities (earthquakes, volcanoes, weathering/erosion/deposition)
- Ring of Fire Mapping activity
- Model Glacier activity
- Erosion/Mountain Building compare and contrast worksheet

Other Evidence:

- Informal Evaluations (rubric based)
- Group Discussions
- Weekly Quizzes
- Chapter Test
- Peer Reviews and Peer Response Groups

Monday	Tuesday	Wednesday	Thursday	Friday
Rock Type Intro Lesson: -Textbook read aloud -Interactive vocabulary game -Mini dictionary	NO SCIENCE	Rock Collection Activity: -Vocabulary review -Classification of rocks gathered by students	Rock Cycle Lesson: -Textbook read aloud -Fill in of rock cycle diagram -Smartboard activity determining rock type	Dirt Cake Lesson: -Textbook read aloud -Poster chart fill in -Creation of cross section of Earth model (the Dirt Cake) QUIZ
Rapid Surface Changes Intro Lesson: -Textbook read aloud -Interactive vocabulary game -Mini dictionary	NO SCIENCE	Earthquaker Activity: -Creation of model earthquake/fault lines -Prediction/Inferences	Cause and Effect (Earthquakes): -Textbook guided reading -Earthquake sequencing -Open class discussion -Writing activity	Seymour Simon's Earthquakes Lesson: -Measuring earthquakes -Affects on people/culture -First person writing activity
Volcanoes Intro Lesson: -Textbook read aloud -Interactive vocabulary game -Mini dictionary	NO SCIENCE	Volcanoes "Where Are They?" Lesson: -Textbook guided reading -Poster chart fill in -Ring of Fire mapping activity -Historical volcano research activity	Cause and Effect (Volcanoes): -Textbook guided reading -Volcano event sequencing -Open class discussion -Writing activity- other events associated with volcanoes	Seymour Simon's Volcanoes Lesson: -Guided read aloud -Poster chart fill in -Analyze pictures/graphics -Writing activity based on culture of people around volcanoes QUIZ
Slow Surface Changes Intro Lesson: -Textbook read aloud - Interactive vocabulary game -Graphic organizer assignment -Mini dictionary	NO SCIENCE	Model Glacier Activity: -Creating model glacier -Making predictions and inferences -Writing activity on review of main points	Weath./Dep./Erosion Lesson: -Textbook guided reading -Poster chart fill in -Cause and effect chart -Erosion writing activity	Big and Small Lesson: -Textbook reading -Smartboard activity compare/contrast QUIZ

UNIT TEST: Given at the end of the unit where most applicable.

Lesson 1

Teacher: Mr. Werner

Subject Area: Earth Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Rock Types

Objectives:

- Students will become familiar with the vocabulary terms concerning rock types
- Students will understand different properties of each rock type
- Students will complete an online vocabulary activity.

Materials/Resources Needed:

- Science Textbook, notebook (laptops) and/or computer

Anticipatory Set:

- I will be reading the textbook with you and I want you to think about the things you are hearing. Then, you will help me in determining definitions of important terms and write them on our ELMO. What are the terms you heard for the first time or ones that sound unusual? Find them in the book. How do these terms/definitions relate to what you know already or your previous knowledge base?
- Open up the website:
http://www.eduplace.com/science/hmsc/4/c/vocabgames/vcb_4c.html to play the vocabulary game.
- Students will create a mini science dictionary of words from the lesson they will add on to with other lessons.

Objective/Purpose:

- Students will be able to locate, define and understand the vocabulary terms associated with the different rock types. They will then use the knowledge they learned to play the interactive vocabulary game on the website.

Input:

- They need to know how to use the computers and internet while navigating web pages, how to effectively use the book to understand key (highlighted in bold) terms pertaining to the new material.

Model:

- The teacher needs to identify an unusual/important term and then place it on the chart. Then, use the text and glossary to come up with a definition and write it in the definition side of the chart. Fill out the “making connection” side of the chart to model how this should be filled out.

Check for Understanding:

- Stop and ask questions about what they are reading to make sure they are understanding and not just reading. Ask these questions before, during and after text read aloud. Review main points to emphasize key terms/ideas.

Guided Practice:

- The guided practice will be the internet website vocabulary game along with the read aloud from the textbook. Approximately 20 minutes.

Closure:

- Ask students what they have learned and tell me something they enjoyed about what they learned. Get feedback on the success of the interactive game.
- Informally evaluate each students notebooks and check for completion as well as understanding for the “making connection” side of the chart.

Independent Practice:

- Students will be given a crossword puzzle complete with terms as well as definitions based on the vocabulary terms discussed and explained in class. It will be due the next Science classroom time slot.

Lesson 2

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Rock Collection Activity

Objectives:

- Students will be able to identify the characteristics/traits of different rocks.
- Students will determine different ways to classify/categorize/sort their rocks.
- Students will be able to relate their rocks with rocks around their home.
- Students will understand how rocks differ/compare with each other.

Materials/Resources Needed:

- Bin full of different rocks, students collected rocks, rock quality worksheet, rulers/tape measures, weak acid.

Anticipatory Set:

- Take out the rocks that you collected on your own and spread them out on your desk. Record some observations or qualities of the rocks that you have (using known words like appearance, hardness, presence/absence of CaCO₃ (acid test), size – length, mass). Compare/contrast your rocks with the rocks in the bin located in the front of the room.
- Sort them into different piles based on some of your observations. Ask surrounding classmates and the teacher for hints/ideas to help you.

Objective/Purpose:

- Students will understand the similarities and differences rocks have based on their physical/chemical properties. Students will question why these sim./diff. occur and begin to ask more questions based on rock classification. These are important to introduce the next topic of rock origin and the reasons that rocks differ or compare. Also, this activity is great for students to start noticing the natural world around them by collecting rocks they frequently see.

Input:

- The students will need to know terms/concepts such as hardness, texture, minerals, classify, measurement.
- Basic vocabulary that was discussed in previous lesson.

Model:

- Teacher will demonstrate how to examine and evaluate rocks and begin to fill in the chart accordingly.

Check for Understanding:

- Walk around the room and observe what the students are writing on their worksheets. Model additional rock evaluations to ensure understanding of what students are to look for.

Guided Practice:

- The completion of their own rock evaluations will be the student practice. Lasting approximately 20 minutes.

Closure:

- Informally evaluating the questions being asked and the ideas that are being generated on the worksheets. Think about how the students are performing, specifically the interest level and quality of work being completed. Having a review of key terms and findings from volunteers will be a great way for students to reflect on the lesson.

Independent Practice:

- Hand out the take home writing activity titled, “Finding the fake rock”. This activity is about seeing an ad for fake rocks that are hollow so people can put things underneath them. The student will then be asked to write down ideas about the features that rocks should have to look real.

Lesson 3

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: The Rock Cycle

Objectives:

- Students will understand the different types that make up the earth's crust.
- Students will know how rocks from each rock type are formed.
- Students will understand how the concept of the cycle representing the way that rocks interrelate with each other.
- Students will know how to use an interactive smartboard activity.

Materials/Resources Needed:

- Smartboard, Science Textbook, example from each rock type, poster board, rock chart.

Anticipatory Set:

- Students will complete a guided read aloud of textbook to become familiar with rock types and the rock cycle.
- Teacher will introduce a rock from each type and explain the reasons why based on the information from the textbook.
- Have you seen any of these rocks before? Would you be able to locate all of these rocks in your city/neighborhood/state, why or why not?
- What is the difference between sediment and sedimentary rock?
- What is the difference between minerals and rocks?

Objective/Purpose:

- Students will be able to list rock qualities from each rock type and explain the significance of the rock cycle in determining the relationship between rocks.
- The students will become familiar with the origin of rocks and where they are located. Also, why certain rocks are only seen in some areas.
- These concepts are important to emphasize the differences and similarities as well as the other relationships rocks have with each other.

Input:

- Students will need to know appropriate vocabulary terms, the qualities of rocks learned from previous lesson and difference between minerals in their diet and rock minerals.

Model:

- Teacher will need to introduce the smartboard activity and how it functions. Teacher will also need to emphasize main points from the guided textbook reading and show how they relate to the rock examples being displayed.

Check for Understanding:

- Observe their answers to key questions and whether or not they are asking questions themselves. Because this material is new and different, the teacher will need to consistently check for understanding by giving modeling examples throughout the lesson.

Guided Practice:

- Students will each be given a set of rocks and then be asked to determine which rock type they think it is. Students will be required to provide evidence/reasons why. This will last approximately 15 minutes.

Closure:

- The review will be how the students classify the rocks that they have in their pile. Students will be asked to hold up the rock that they feel is sedimentary, metamorphic, igneous, to determine their understanding of which rocks were supposed to go where.

Independent Practice:

- No homework will be related with this activity.

Lesson 4

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Dirt Cake

Objectives:

- Students will know the Earth's layers and the qualities/properties of each.
- Students will create a model (dirt cake) representing a cross section of the earth.
- Students will begin to create the relationship between the rock types and the earth's layers.

Materials/Resources Needed:

- Crushed Oreos, whipped cream/ice cream, gummy worms/bears, chocolate graham crackers, instant pudding, Science textbook

Anticipatory Set:

- The teacher will conduct a guided read aloud of the "Earth's crust" section of the textbook. A poster chart will be filled out with help from the students detailing the layers of the earth's crust and the definitions of each.
- Students will create a cross section of the earth by making "dirt cake", a desert made up of the materials listed in the materials section. They will choose which ingredient best represents each of the layers of the earth.

Objective/Purpose:

- Students will be able to identify the earth's layers and the properties of them.
- This is important to create a relationship between the earth's layers, the function of each, and the rocks that originate from them.

Input:

- The necessary vocabulary terms learned in previous lessons, the properties of the ingredients need to make the dirt cake, what a cross section means and how it is used to understand the earth's layers.

Model:

- The teacher will do the guided read aloud to aid the students understanding. The teacher will also be modeling how to create the dirt cake and the procedures needed to follow to ensure that participation is being done in an appropriate manner.
- Also modeling how to complete the poster chart based off of the textbook material.

Check for Understanding:

- Evaluating the outcome of the read aloud as well as the completion of the dirt cake activity is a great way to check for understanding. Asking questions to you such as, “Are they engaged? Do they ask questions? Can they relate the rock types with the layers?”

Guided Practice:

- The guided read aloud
- The dirt cake activity
- Both approximately 45 minutes.

Closure:

- Simply asking what they have learned from the textbook and the dirt cake activity.
- Evaluate the dirt cakes that each student has created before they eat them. Address the class with questions about why they put certain ingredients where.

Independent Practice:

- A fill in the blank worksheet will be given to the students. This worksheet pertains to the connections between rock types, the earth’s crust and the dirt cake activity.

Lesson 5

Teacher: Mr. Werner

Subject Area: Earth Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Rapid Surface Changes

Objectives:

- Students will become familiar with the vocabulary terms concerning rapid surface changes.
- Students will understand different ways our surface changes quickly.
- Students will complete an online vocabulary activity.

Materials/Resources Needed:

- Science Textbook, notebook (laptops) and/or computer

Anticipatory Set:

- I will be reading the textbook with you and I want you to think about the things you are hearing. Then, you will help me in determining definitions of important terms and write them on our ELMO. What are the terms you heard for the first time or ones that sound unusual? Find them in the book. How do these terms/definitions relate to what you know already or your previous knowledge base?
- Open up the website:
http://www.eduplace.com/science/hmsc/4/c/vocabgames/vcb_4c.html to play the vocabulary game.
- Students will create a mini science dictionary of words from the lesson they will add on to with other lessons.

Objective/Purpose:

- Students will be able to list, define and understand the vocabulary terms associated with rapid surface changes. They will then use the knowledge they learned to play the interactive vocabulary game on the website.

Input:

- They need to know how to use the computers and internet while navigating web pages, how to effectively use the book to understand key (highlighted in bold) terms pertaining to the new material.

Model:

- The teacher needs to identify an unusual/important term and then place it on the chart. Then, use the text and glossary to come up with a definition and write it in the definition side of the chart. Fill out the “making connection” side of the chart to model how this should be filled out.

Check for Understanding:

- Stop and ask questions about what they are reading to make sure they are understanding and not just reading. Ask these questions before, during and after text read aloud. Review main points to emphasize key terms/ideas.

Guided Practice:

- The guided practice will be the internet website vocabulary game along with the read aloud from the textbook. Approximately 20 minutes.

Closure:

- Ask students what they have learned and tell me something they enjoyed about what they learned. Get feedback on the success of the interactive game.
- Informally evaluate each students notebooks and check for completion as well as understanding for the “making connection” side of the chart.

Independent Practice:

- Students will be given a crossword puzzle complete with terms as well as definitions based on the vocabulary terms discussed and explained in class. It will be due the next Science classroom time slot.

Lesson 6

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Earthquake

Objectives:

- Students will understand the relationship that buildings have with the earth's crust.
- Students will analyze the effects of an earthquake based on the model they will create.
- Students will predict what will happen to their model when an earthquake is recreated.

Materials/Resources Needed:

- Square aluminum pan (used for baking), cardboard strips, damp sand, serving trays, newspaper, paper cups, activity worksheet.

Anticipatory Set:

- Students will work in partners to complete the exercise. The activity includes putting sand in a pan and tamping it down. Sand will be placed over two strips of cardboard (the earth's crust). Flip the whole mixture upside down onto tray and place paper cups on top of the sand. Predict what will happen when the strips of cardboard move and record results. Observe what happened and record.

Objective/Purpose:

- The objective for this activity includes modeling what happens during an earthquake, identifying the fluidity of our earth's upper level surfaces.
- Also, inferring and predicting what will happen when we create an experiment like one like this.

Input:

- The earth's layers, what the earth's surface looks like when an earthquake occurs, and the terminology used that was derived from the textbook.
- This will be communicated to the students through the introduction of the material through the review of vocabulary terms in the previous lesson and the modeling of how to make informed inferences and predictions.

Model:

- An effective way to model this exercise is to first start with the review of vocabulary terms and the uses of those terms.
- Ensure that during the collaborate and building portion of the activity the teacher is showing how to build the model. The teacher will demonstrate the build by following the directions along with the students.

Check for Understanding:

- Ask questions about the vocabulary terms and make sure students understand definitions before proceeding with activity.
- Call for students to come up to the white board and write down what they think will happen when they move the cardboard. Several groups should do this.
- Create checkpoints to make sure that each group of students is not falling behind in the steps to make their model.
- Check worksheets for answers to questions regarding inferences and predictions.

Guided Practice:

- The teacher will need to model as well as guide the groups in making a correct model so that the results will be consistent for everyone. Total time should be 50 minutes.

Closure:

- Asking the class direct questions about the results that they found. Call for volunteers to share what they learned from the building portion of the activity as well as the observation portion. Have more students come to the white board and write down their observations.

Independent Practice:

- No homework for this activity.

Lesson 7

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Cause and Effect

Objectives:

- Students will understand the concept of cause and effect.
- Students will sequence the events leading up to an earthquake.
- Students will complete the cause and effect chart to understand rapid surface changes.

Materials/Resources Needed:

- Science textbook (portion on earthquakes), cause and effect chart, smartboard.

Anticipatory Set:

- The earthquake section of the appropriate science textbook concerning earthquakes will be read and vocabulary terms along with major events of an earthquake will be written on the smartboard.
- The influence of earthquakes on the earth's surface (the land, buildings, roads, other objects...) will be discussed in an open classroom discussion.
- A cause and effect chart will be filled in to help sequence the events of an earthquake.

Objective/Purpose:

- The students will be able to list in order the events leading up to an earthquake.
- Students will list the different directions the sections of the crust move in an earthquake.
- These are important in understanding the properties of the crust as well as the causes of earthquakes. Also, the damaging effects earthquakes can cause to the surrounding environment.

Input:

- Students will need to know definitions of the important vocabulary terms, the concepts behind earthquake origination and the relationship between causes and effects.

Model:

- The teacher will need to demonstrate, using the cause and effect chart, how to sequence an event (tying your shoes) by starting from the beginning and ending with the conclusion of the event.
- The teacher will also show interactive models (smartboard) of how earthquakes occur.

Check for Understanding:

- The teacher will ask the students to give the events of an earthquake. Teacher will display them on the smartboard.
- Teacher will walk around and assist any students with trouble they are having with the cause and effect chart.

Guided Practice:

- The review of vocabulary terms and definitions.
- Explaining the relationship between cause and effect related to sequential events such as earthquakes.
- Modeling the cause and effect chart by filling out an event with a cause and effect associated with it.
- Time frame: 45 minutes

Closure:

- The evaluation of this activity is the answers given for the sequence of an earthquake as well as the results from the cause and effect worksheet.

Independent Practice:

- Students are to review the earthquake sequence and write down things that a builder would need to know about earthquakes when building a home for people in an earthquake zone.

Lesson 8

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Seymour Simon's Earthquakes

Objectives:

- Students will understand how earthquakes are measured.
- Students will know how earthquakes affect the people and culture around them.
- Students will know the earthquake zones in the continental United States.
- Students will understand the concept of faults.

Materials/Resources Needed:

- *Earthquakes* by Seymour Simon, "important ideas" poster chart

Anticipatory Set:

- Teacher will conduct a guided read-aloud with the Earthquakes book. Teacher will stop periodically to ask questions and assess understanding of topics brought up in the book.
- Pictures and diagrams will be analyzed to understand information addressed.
- The poster chart will be filled in with any cool or interesting information brought up in the reading. Students will be prompted to determine the main ideas and new concepts/ideas delivered in the book and those will be written on the chart.

Objective/Purpose:

- The purpose of this lesson is to provide visual as well as literal examples of where major earthquakes occur, how they are measured and the effects that earthquakes have on the surrounding environment. Students will then be able to transfer this knowledge to a writing assignment given at the end of the lesson. This will be important so that student can write in their own words feelings and events occurring when earthquakes occur.

Input:

- The important vocabulary terms and definitions will be needed along with the understanding of the earth's continents (ie. location, size, people from them).

Model:

- The teacher will need to demonstrate and inform the students what the important ideas from the book are. Listing and explaining important ideas and the reasons for why these ideas were chosen is an additional way to model for this lesson.

Check for Understanding:

- The teacher will check for understanding by evaluating the answers given when filling out the chart.
- Evaluating the understanding for the directions associate with the writing activity.

Guided Practice:

- The guided read-aloud is a beneficial way for students to understand important concepts related to the topic of earthquakes. Asking questions to motivate understanding and helping students to formulate questions that they might have so they can further comprehend the new information.

Closure:

- Reviewing the poster chart that was filled out and coming up with extensions to the ideas and concepts talked about in the book would be the conclusion. Getting as many responses from the students would also be helpful in determining the level of understanding.

Independent Practice:

- The homework for this activity involves a writing activity. Students will be required to write a short story about what it feels like to be in an earthquake and the things that you observed. Encourage students to read first person accounts and choose a historical earthquake as the setting. Remind students to include details about the causes and effects of the earthquake that their fictional person endures.

Lesson 9

Teacher: Mr. Werner

Subject Area: Earth Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Volcanoes

Objectives:

- Students will become familiar with the vocabulary terms concerning volcanoes
- Students will understand different properties of the different volcanoes
- Students will complete an online vocabulary activity.

Materials/Resources Needed:

- Science Textbook, notebook (laptops) and/or computer

Anticipatory Set:

- I will be reading the textbook with you and I want you to think about the things you are hearing. Then, you will help me in determining definitions of important terms and write them on our ELMO. What are the terms you heard for the first time or ones that sound unusual? Find them in the book. How do these terms/definitions relate to what you know already or your previous knowledge base?
- Open up the website:
http://www.eduplace.com/science/hmsc/4/c/vocabgames/vcb_4c.html to play the vocabulary game.
- Students will create a mini science dictionary of words from the lesson they will add on to with other lessons.

Objective/Purpose:

- Students will be able to locate, define and understand the vocabulary terms associated with the different types of volcanoes. They will then use the knowledge they learned to play the interactive vocabulary game on the website.

Input:

- They need to know how to use the computers and internet while navigating web pages, how to effectively use the book to understand key (highlighted in bold) terms pertaining to the new material.

Model:

- The teacher needs to identify an unusual/important term and then place it on the chart. Then, use the text and glossary to come up with a definition and write it in the definition side of the chart. Fill out the “making connection” side of the chart to model how this should be filled out.

Check for Understanding:

- Stop and ask questions about what they are reading to make sure they are understanding and not just reading. Ask these questions before, during and after text read aloud. Review main points to emphasize key terms/ideas.

Guided Practice:

- The guided practice will be the internet website vocabulary game along with the read aloud from the textbook. Approximately 20 minutes.

Closure:

- Ask students what they have learned and tell me something they enjoyed about what they learned. Get feedback on the success of the interactive game.
- Informally evaluate each students notebooks and check for completion as well as understanding for the “making connection” side of the chart.

Independent Practice:

- Students will be given a crossword puzzle complete with terms as well as definitions based on the vocabulary terms discussed and explained in class. It will be due the next Science classroom time slot.

Lesson 10

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Volcanoes, Where are they?

Objectives:

- Students will be able to locate significant areas of volcanoes (the Ring of Fire)
- Students will learn about Mount St. Helens and the significance of the event.
- Students will be able to map out the world's most actively volcanic locations.

Materials/Resources Needed:

- Science textbook chapter on volcanoes, poster chart, notebooks (laptops) or computers,

Anticipatory Set:

- Teacher will complete a guided read aloud for the chapter concerning volcanoes.
- Students will then become more familiar with Mount St. Helens via the read aloud and subsequent filling out of poster chart about important events. Specifically, the significance of the event regarding scientific research and observation as well as the effects on the regional/local environment and the people that live there.
- Students will complete a mapping activity that requires students to locate the most actively volcanic sites worldwide. They will need to research the "ring of fire" and other hotspots to color code a world map.

Objective/Purpose:

- By the end of the lesson students will be able to describe the regions of the world where the volcanoes are presently located. Students will also retell the story of Mount St. Helens and the events that unfolded during the span of major volcanic activity occurring in 1980. Students will be able to describe the ring of fire and why the volcanoes around the world occur where they do.

Input:

- Students must be familiar with a worldwide map as well as the location of Mount St. Helens.

- The familiar vocabulary learned in previous lessons concerning volcanoes and volcanic processes.
- Students must know how to effectively research credible sources on the internet and software provided by the district.
- These expectations will be gone over in detail when the time is appropriate to ensure that all work is done in an appropriate manner.

Model:

- The teacher should give some good internet resources to use so that students are on task but other than that the students should be doing most of the work.
- The mapping activity may require some additional modeling but the students will be learning as they complete the work.

Check for Understanding:

- The completed work is done correctly with areas highlighted and defined appropriately and is not simply a coloring project.
- Students have great input for the poster chart about Mount St. Helens. Specifically, they are noticing the major concepts and ideas.

Guided Practice:

- The teacher will point out the important events/actions for any volcano so that the students recognize them when learning about Mount St. Helens.

Closure:

- A general review of the overall big picture concept about the Ring of Fire and how it has played a role in learning more about plate tectonics and volcanoes.
- The teacher will ask students about what are the major event so volcanoes and why do they occur.

Independent Practice:

- Research a historical volcano of your choosing and prepare a one page diagram/poster of the things you would want to describe if someone asked you about that volcano. Feel free to using drawings, pictures, magazines, computer generated work, and your own writing to complete this project.

Lesson 11

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Cause and Effect: Volcanoes

Objectives:

- Students will sequence the events leading up to, during and after a volcano.
- Students will complete the cause and effect chart to understand volcanoes.
- Students will know the relationship between cause and effect

Materials/Resources Needed:

- Science textbook (portion on volcanoes), cause and effect chart, smartboard.

Anticipatory Set:

- The volcano section of the appropriate science textbook concerning volcanoes will be read and vocabulary terms along with major events of a volcano will be written on the smartboard.
- The influence of volcanoes on the earth's surface (the land, buildings, roads, other objects...) will be discussed in an open classroom discussion.
- A cause and effect chart will be filled in to help sequence the events of a volcano.

Objective/Purpose:

- The students will be able to list in order the events leading up to a volcano.
- Students will list the different events and detrimental events that may occur after a volcano erupts.
- These are important in understanding the properties of the crust as well as the causes of volcanoes. Also, the damaging effects volcanoes can cause to the surrounding environment.

Input:

- Students will need to know definitions of the important vocabulary terms, the concepts behind volcano origination and the relationship between causes and effects.

Model:

- The teacher will need to demonstrate, using the cause and effect chart, how to sequence an event (tying your shoes) by starting from the beginning and ending with the conclusion of the event.
- The teacher will also show interactive models (smartboard) of how volcanoes occur.

Check for Understanding:

- The teacher will ask the students to provide the events of a volcano. Teacher will display them on the smartboard.
- Teacher will walk around and assist any students with trouble they are having with the cause and effect chart.

Guided Practice:

- The review of vocabulary terms and definitions.
- Explaining the relationship between cause and effect related to sequential events such as volcanoes as well as earthquakes.
- Modeling the cause and effect chart by filling out an event with a cause and effect associated with it.
- Time frame: 45 minutes

Closure:

- The evaluation of this activity is the answers given for the sequence of a volcano as well as the results from the cause and effect worksheet.

Independent Practice:

- Students are to review the volcano sequence and describe what the other events associated with volcanoes. Students will need to provide definitions for these other events and be able to orally describe them when asked.

Lesson 12

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Seymour Simon's Volcanoes

Objectives:

- Students will understand how volcanoes are classified.
- Students will know how volcanoes affect the people and culture around them.
- Students will know the active volcanoes in the United States.

Materials/Resources Needed:

- *Volcanoes* by Seymour Simon, *Volcanoes and Earthquakes* by Rebecca Hunter, "important ideas" poster chart

Anticipatory Set:

- Teacher will conduct a guided read-aloud with the Volcanoes books. Teacher will stop periodically to ask questions and assess understanding of topics brought up in the books.
- Pictures and diagrams will be analyzed to understand information addressed.
- The poster chart will be filled in with any cool or interesting information brought up in the reading. Students will be prompted to determine the main ideas and new concepts/ideas delivered in the book and those will be written on the chart.

Objective/Purpose:

- The purpose of this lesson is to provide visual as well as literal examples of where major volcanoes occur, how they are classified and the effects that volcanoes have on the surrounding environment. Students will then be able to transfer this knowledge to a writing assignment given at the end of the lesson. This will be important so that students can write in their own words feelings and events occurring when earthquakes occur.

Input:

- The important vocabulary terms and definitions will be needed along with the understanding of earthquakes.
- This will be communicated to them via review of previous lessons.

Model:

- The teacher will need to demonstrate and inform the students what the important ideas from the books are. Listing and explaining some important ideas and the reasons for why these ideas were picked is another way to model.

Check for Understanding:

- The teacher will check for understanding by evaluating the answers given when filling out the chart.
- Evaluating the understanding for the directions associate with the writing activity.

Guided Practice:

- The guided read-aloud is a beneficial way for students to understand important concepts related to the topic of volcanoes and the relationship they have with earthquakes. Asking questions to motivate understanding and helping students to formulate questions that they might have is ideal to retain and further comprehension of new information.

Closure:

- The conclusion would include reviewing the poster chart that was filled out and coming up with extensions to the ideas and concepts talked about in the books. Getting as many responses from the students would also be helpful in determining the level of understanding.

Independent Practice:

- The homework for this activity involves a writing activity. Students will be required to write a short story about what it feels like to be in or around an active volcano and the things that you observed. Encourage students to read first person accounts and choose a historical volcanic eruption as the setting. Remind students to include details about the causes and effects of the volcanic eruption that their fictional person endures.

Lesson 13

Teacher: Mr. Werner

Subject Area: Earth Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Slow Surface Changes

Objectives:

- Students will become familiar with the vocabulary terms concerning slow surface changes.
- Students will understand different ways our surface changes slowly.
- Students will complete an online vocabulary activity.

Materials/Resources Needed:

- Science Textbook, notebook (laptops) and/or computer

Anticipatory Set:

- I will be reading the textbook with you and I want you to think about the things you are hearing. Then, you will help me in determining definitions of important terms and write them on our ELMO. What are the terms you heard for the first time or ones that sound unusual? Find them in the book. How do these terms/definitions relate to what you know already or your previous knowledge base?
- Open up the website:
http://www.eduplace.com/science/hmsc/4/c/vocabgames/vcb_4c.html to play the vocabulary game.
- Students will create a mini science dictionary of words from the lesson they will add on to with other lessons.

Objective/Purpose:

- Students will be able to list, define and understand the vocabulary terms associated with slow surface changes. They will then use the knowledge they learned to play the interactive vocabulary game on the website.

Input:

- They need to know how to use the computers and internet while navigating web pages, how to effectively use the book to understand key (highlighted in bold) terms pertaining to the new material.

Model:

- The teacher needs to identify an unusual/important term and then place it on the chart. Then, use the text and glossary to come up with a definition and write it in the definition side of the chart. Fill out the “making connection” side of the chart to model how this should be filled out.

Check for Understanding:

- Stop and ask questions about what they are reading to make sure they are understanding and not just reading. Ask these questions before, during and after text read aloud. Review main points to emphasize key terms/ideas.

Guided Practice:

- The guided practice will be the internet website vocabulary game along with the read aloud from the textbook. Approximately 20 minutes.

Closure:

- Ask students what they have learned and tell me something they enjoyed about what they learned. Get feedback on the success of the interactive game.
- Informally evaluate each students notebooks and check for completion as well as understanding for the “making connection” side of the chart.

Independent Practice:

- Students will be given a graphic organizer focusing on finding appropriate synonyms and antonyms for the given vocabulary words. Some words may have larger graphic organizers than others but they generally will look similar. Students will have it completed the assignment and turn it in at the end of the week for full credit.

Lesson 14

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Model Glacier

Objectives:

- Students will understand the composition and effects glaciers have on the surrounding landscape.
- Students will learn the importance of working with group members.
- Students will learn to make predictions and inferences based upon the initial set up of the activity.

Materials/Resources Needed:

- Paper cups, sand and small pebbles, freezer, bar of soap, worksheet to record observations.

Anticipatory Set:

- In groups, students will prepare their “glacier” by placing water, sand and pebbles into a paper cup and then place it into a freezer.
- After frozen for 24 hours, students will then take the cup mixture and rub it over a bar of soap.
- Students will record observations and make predictions/inferences about how a glacier would affect the Earth's surface.

Objective/Purpose:

- Students will be able to fully understand the action of a glacier on the ground they walk on.
- Students will visualize the deposition and erosion going on when a glacier moves on the landscape.
- This will be important for students to understand the nature in which glaciers move and how they have changed the landscape we live on today.

Input:

- Essential information includes knowing the composition of a glacier (ice, sand, boulders, rocks), how they moved on the Earth's surface and the landforms they created.

Model:

- The teacher will be modeling the creation of their model glacier and ensure that proper procedures are being done to make the activity successful.
- The teacher will stand in front of the room to model the glacier build as well as walking around to help any groups with problems they may have with the recording of observations and the predictions the students might have.

Check for Understanding:

- Teacher will informally check the progress and completion of preparation through observations gathered by assisting groups.
- The teacher will also check understanding by evaluating the worksheets. Specifically, the observation, prediction, and conclusion portion of the worksheet handed in.

Guided Practice:

- Guided practice will be the assisting with creation of their model glacier and the physical action they observe while imitating the movement of a glacier.
- Time will be 20 minutes.

Closure:

- Teacher will review observations and predictions that groups had at the end of class.
- A "show and tell" segment will aid the students in understanding trials and tribulations that other classmates had.

Independent Practice:

- A brief writing activity involving a review of the activities main points.
- Students will create a paragraph that describes the main ideas from the activity.

Lesson 15

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Weathering Deposition and Erosion Cause and Effect

Objectives:

- Students will understand the concept of cause and effect.
- Students will sequence the events of weathering, deposition and erosion.
- Students will complete the cause and effect chart to understand slow surface changes.
- Students will analyze the differences and similarities regarding weathering, deposition and erosion.

Materials/Resources Needed:

- Science textbook (portion on weathering, deposition and erosion), cause and effect chart, smartboard.

Anticipatory Set:

- The slow surface changes section of the appropriate science textbook concerning weathering, deposition and erosion will be read and vocabulary terms along with major events of those events will be written on the smartboard.
- The influence of these slow processes on the earth's surface (the land, water, plants/trees, and other objects...) will be discussed in an open classroom discussion.
- A cause and effect chart will be filled in to help sequence the events of weathering, erosion and deposition.

Objective/Purpose:

- The students will be able to list in order the events that occur during weathering, deposition and erosion.
- Students will list the differences and similarities of these slow surface changes in a cause and effect chart.
- These are important in understanding the modality, composition and action of weathering, deposition and erosion. Also, it is important to understand the relationship between these slow surface changes and the landscape we live in today.

Input:

- Students will need to know definitions of the important vocabulary terms, the concepts behind weathering, deposition and erosion and the relationship between causes and effects.

Model:

- The teacher will need to demonstrate, using the cause and effect chart, how to sequence an event (tying your shoes) by starting from the beginning and ending with the conclusion of the event.
- The teacher will also show interactive models (smartboard) of how weathering, deposition and erosion change our Earth's surface slowly.

Check for Understanding:

- The teacher will ask the students to give the events of these slow surface changes. Teacher will display them on the smartboard.
- Teacher will walk around and assist any students with trouble they are having with the cause and effect chart.

Guided Practice:

- The review of vocabulary terms and definitions.
- Explaining the relationship between cause and effect related to sequential events.
- Modeling the cause and effect chart by filling out an event with a cause and effect associated with it.
- Time frame: 20 minutes

Closure:

- The evaluation of this activity is the answers given for the sequence of these slow surface changes as well as the results from the cause and effect worksheet.

Independent Practice:

- Students are to review these slow surface changes and complete a writing activity based on what can someone do to prevent erosion on several different landforms. These landforms are: a hill that was involved in a forest fire, a large sand dune, a snowy mountain or a creek bank after a large rain event.

Lesson 16

Teacher: Mr. Werner

Subject Area: Science

Grade Level: 4th Grade

Unit Title: Forces That Shape Our Earth's Surface

Lesson Title: Big and Small Slow Surface Changes

Objectives:

- Students will understand the effects of slow surface changes on the environment around them.
- Students will learn how small events such as erosion, change the landscape and how big events like mountain building change the environment slowly.
- Students will be able to evaluate the two processes and compare/contrast.

Materials/Resources Needed:

- Appropriate science textbook (erosion and mountain building sections), compare/contrast worksheet, smartboard.

Anticipatory Set:

- Students will read the required section on slow surface changes (portion on erosion and mountain building) and assist teacher with comparing and contrasting the two slow surface changing events.
- All input will be displayed on the smartboard so all students will visually see the answers given.

Objective/Purpose:

- At the end of this lesson, students will be able to describe in their own words the similarities and differences that erosion and mountain building have with one another.
- Students will also learn how to evaluate two very different but similar concepts.
- This will be important to understand that even though we don't always see these events occurring, they are both significant in different ways.

Input:

- The necessary vocabulary and terms defined in previous lessons.

- Students must know the concept of slow surface changes and the definitions of erosion and mountain building.

Model:

- The teacher will model how to come up with differences and similarities and the questions you need to ask yourself when deciding what concepts/thoughts are valid.

Check for Understanding:

- The teacher will be informally assessing the students through the discussion responses and input given by the students.
- The teacher will need to consistently stop and check understanding by asking questions pertaining to the ideas given by the students during discussion.

Guided Practice:

- Activities include showing how someone can relate to different but yet similar topics and show this relationship through written work on a smartboard.
- Time frame: 5 minutes.

Closure:

- The closure will include a review through discussion of key points learned by the lesson.
- The evaluation of this lesson will be the scoring of the daily points rubric that teacher fills in daily.

Independent Practice:

- No assignment for this lesson.

Rubric For Group/Partner Activities:

Name: _____

Activity	Excellent	Good	Fair	Poor	Not Done	STUDENT ASSESSMENT	TEACHER ASSESSMENT
	Student independently follows all directions as written cleans up as directed	Student follows written directions.	Student needs constant assistance, may leave materials out	Student attempts to perform activity without reading or following directions, does not clean up	Student did not attempt to perform activity.		
Group Work	Excellent	Good	Fair	Poor	Not Done	STUDENT ASSESSMENT	TEACHER ASSESSMENT
	Contributed exceptional effort to the group's project and showed leadership in to organizing group efforts. Exhibited positive, supportive attitude toward group members. Completed share of work with great effort.	Contributed great effort to the group's project and helped organize group efforts. Exhibited positive, supportive attitude toward group members. Completed share of work with great effort.	Contributed fair effort to the group's project Exhibited positive, supportive attitude toward group members. Completed share of work with fair effort.	Contributed little effort to the group's project. Exhibits negative attitudes toward group members. Did not complete his or her share of work.	Contributed no effort to the group's project. Exhibits negative attitudes toward group members. Did not complete his or her share of work.		

Name _____

Rock Collection Activity

Scoring Criteria	1	2	3	4
Student followed instructions to classify rocks according to their properties.				
Student observed each of the rocks by: using a hand lens, used weak acid as well as measured using a ruler/tape measure.				
Student collected data by recording observations.				
Student classified rocks in different ways.				
Student listed the properties used to group the rocks.				

Score: Total Points	
Score: % Equivalent	

Scoring Key

- 4 points** correct, complete, detailed
- 3 points** partially correct, complete, detailed
- 2 points** partially complete, partially complete, lacks some detail
- 1 point** incorrect or incomplete, needs assistance

COMMENTS: